AMENDMENTS TO THE CLAIMS

1. (Previously presented) A system comprising:

an integrated circuit on a VLSI die; and

an embedded micro-controller constructed on the VLSI die, the micro-controller adapted to monitor and control the VLSI environment to optimize the integrated circuit operation;

wherein said embedded micro-controller monitors temperatures at a plurality of locations on the integrated circuit.

2. (Previously presented) The system of claim 1 wherein the embedded micro-controller also monitors one or more of the parameters selected from the group consisting of:

the power supplied to the integrated circuit;

the operating clock frequency of the integrated circuit;

the power supply voltage; and

the power supply current supplied to the integrated circuit.

3. (Original) The system of claim 1 wherein the embedded micro-controller controls at least one of the following parameters:

temperatures at one or more locations on the integrated circuit;

the integrated circuit power supply;

the operating clock frequency of the integrated circuit;

the power supply voltage; and

the power supply current supplied to the integrated circuit.

4. (Original) The system of claim 1 wherein the integrated circuit comprises two or more processor cores, each core having a integer unit and a floating point unit, the micro-controller further comprising:

temperature sensors at each of the integer units and floating point units on each of the cores.

5. (Original) The system of claim 1 further comprising:

embedded ammeters constructed on the VLSI integrated circuit die, the ammeters comprising voltage controlled oscillators.

6. (Original) The system of claim 1 further comprising:

fuses that provide hardware selection of VLSI integrated circuit environment parameters that are monitored by the embedded micro-controller.

7. (Previously presented) The system of claim 1 further comprising:

updateable or replaceable firmware for controlling operations of the embedded micro-controller; said firmware comprising:

algorithms for determining how to respond to temperature, power, voltage, or clock parameters

8. (Previously presented) A method for monitoring and controlling an integrated circuit comprising:

providing an embedded micro-controller on a same VLSI die as the integrated circuit; and

monitoring and controlling a VLSI environment of the integrated circuit with the embedded micro-controller; wherein

said embedded micro-controller monitors temperatures at a plurality of locations on the integrated circuit.

9. (Previously presented) The method of claim 8 further comprising:

also monitoring, by the embedded micro-controller, one or more integrated circuit parameters selected from the group consisting of:

the power supplied to the integrated circuit;

the operating clock frequency of the integrated circuit;

the power supply voltage; and

the power supply current supplied to the integrated circuit.

10. (Original) The method of claim 8 further comprising:

controlling, by the embedded micro-controller, one or more processor parameters selected from the group consisting of:

temperatures at one or more locations on the integrated circuit;

the integrated circuit power supply;

the operating clock frequency of the integrated circuit;

the power supply voltage; and

the power supply current supplied to the integrated circuit.

11. (Original) The method of claim 8 further comprising:

controlling, using the embedded micro-controller, the VLSI environment to optimize an integrated circuit operating power level to approach a design limit.

12. (Original) The method of claim 8 further comprising:

monitoring, using the embedded micro-controller, a temperature in a location of the integrated circuit; and

reducing, using the embedded micro-controller, a power supply voltage in response to an over-temperature condition in the location.

13. (Original) The method of claim 8 further comprising:

monitoring, using the embedded micro-controller, a temperature in a location of the integrated circuit; and

reducing, using the embedded micro-controller, a processor operating clock frequency in response to an over-temperature condition in the integrated circuit.

14. (Previously presented) The method of claim 8 wherein the integrated circuit is a processor, the method further comprising:

monitoring, using the embedded micro-controller, a temperature in a first core of the processor; and

transferring, using the embedded micro-controller, a processing workload from the first core to a second core of the processor in response to the temperature of said first core.

15. (Original) The method of claim 8 further comprising:

monitoring, using the embedded micro-controller, current levels in the integrated circuit using ammeters comprising one or more voltage controlled oscillators.

16. (Previously presented) A computer program product comprising a computer usable medium having computer readable program code embedded therein, the computer readable program code comprising:

code for controlling an embedded micro-controller constructed on a VLSI integrated circuit die with a processor, wherein the micro-controller monitors and controls a VLSI environment of the processor; where

said embedded micro-controller monitors temperatures at a plurality of locations on the integrated circuit.

17. (Previously presented) The computer program product of claim 16 further comprising:

code for also monitoring, by the embedded micro-controller, one or more integrated circuit parameters selected from the group consisting of:

the power supplied to the integrated circuit;

the operating clock frequency of the integrated circuit;

the power supply voltage; and

the power supply current supplied to the integrated circuit.

18. (Original) The computer program product of claim 16 further comprising:

code for controlling, by the embedded micro-controller, one or more integrated circuit parameters selected from the group consisting of:

temperatures at one or more locations on the integrated circuit;

the integrated circuit power supply;

the operating clock frequency of the integrated circuit;

the power supply voltage; and

the power supply current supplied to the integrated circuit.

19. (Original) The computer program product of claim 16 further comprising:

code for controlling the VLSI environment to optimize an integrated circuit operating power level to approach a design limit.

20. (Original) The computer program product of claim 16 further comprising:

code for monitoring a temperature in a core of the processor; and

code for reducing a power supply voltage in response to an over-temperature condition in the core.

21. (Original) The computer program product of claim 16 further comprising:

code for monitoring a temperature in a core of the processor; and

code for reducing a processor operating frequency in response to an over-temperature condition in the core.

22. (Previously presented) The computer program product of claim 16 further comprising:

code for monitoring a temperature in a first core of the processor; and

code for transferring a processing workload from the first core to a second core of the processor in response to the temperature of said first core.

23. (Original) The computer program product of claim 16 further comprising:

code for monitoring current levels in the integrated circuits using ammeters comprising one or more voltage controlled oscillators.

24. (Previously presented) A system for monitoring and controlling an integrated circuit comprising:

means for providing an embedded micro-controller on a same VLSI die as the integrated circuit; and

means for monitoring and controlling a VLSI environment of the integrated circuit with the embedded micro-controller;

wherein said embedded micro-controller monitors temperatures at a plurality of locations on the integrated circuit.

25. (Original) The system of claim 24 further comprising:

means for controlling, using the embedded micro-controller, the VLSI environment to optimize an integrated circuit operating power level to approach a design limit.

26. (Previously presented) The system of claim 24 further comprising:

means for reducing, using the embedded micro-controller, a power supply voltage in response to an over-temperature condition at one of said plurality of locations.

27. (Previously presented) The system of claim 24 further comprising:

means for reducing, using the embedded micro-controller, a processor operating clock frequency in response to an over-temperature condition in the integrated circuit.

28. (Previously presented) The system of claim 24 wherein the integrated circuit is a processor, the method further comprising:

means for monitoring, using the embedded micro-controller, a temperature in a first core of the processor; and

means for transferring, using the embedded micro-controller, a processing workload from the first core to a second core of the processor in response to the temperature of said first core.

29. (Previously presented) The system of claim 1 wherein

said embedded micro-controller is further adapted to detect a difference in temperatures between said plurality of locations on the integrated circuit and redistribute workload in response to said temperature difference.

30. (Previously presented) The method of claim 8 wherein

said embedded micro–controller detects a difference in temperatures between said plurality of locations on the integrated circuit and redistributes workload in response to said temperature difference.

31. (Currently amended) The computer program product of claim 16 where

said embedded micro–controller detects a difference in temperatures between said plurality of locations on the integrated circuit and redistributes workload in response to said temperature ~~difference~~ difference.

32. (Currently amended) The system of claim 24 where

said embedded micro–controller detects a difference in temperatures between said plurality of locations on the integrated circuit and redistributes workload in response to said temperature ~~difference~~ difference.